09/696,523

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,724,130 B1
DATED : April 20, 2004
INVENTOR(S) : Ji Su et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page should be deleted and substitute therefor the attached title page as shown the attached page.

Drawings,
Replace informal figures 1 through 4 with formal figures 1 through 4 as shown on the attached pages.

Signed and Sealed this

Twenty-sixth Day of April, 2005

JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Su et al.

(10) **Patent No.: US 6,724,130 B1**
(45) **Date of Patent: Apr. 20, 2004**

(54) **MEMBRANE POSITION CONTROL**

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(73) Assignee: **The United States of America as represented by the Administrator of the National Aeronautics and Space Administration**, Washington, DC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 4 days.

(21) Appl. No.: **09/696,523**

(22) Filed: **Oct. 23, 2000**

Related U.S. Application Data

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(51) **Int. Cl.**[7] **H01L 41/08**
(52) **U.S. Cl.** **310/330**; 310/331
(58) **Field of Search** 310/328, 367, 310/368, 330, 331, 332, 324

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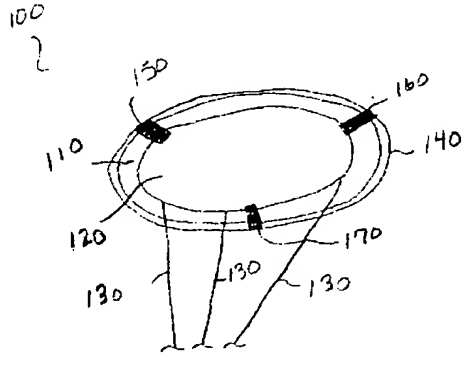
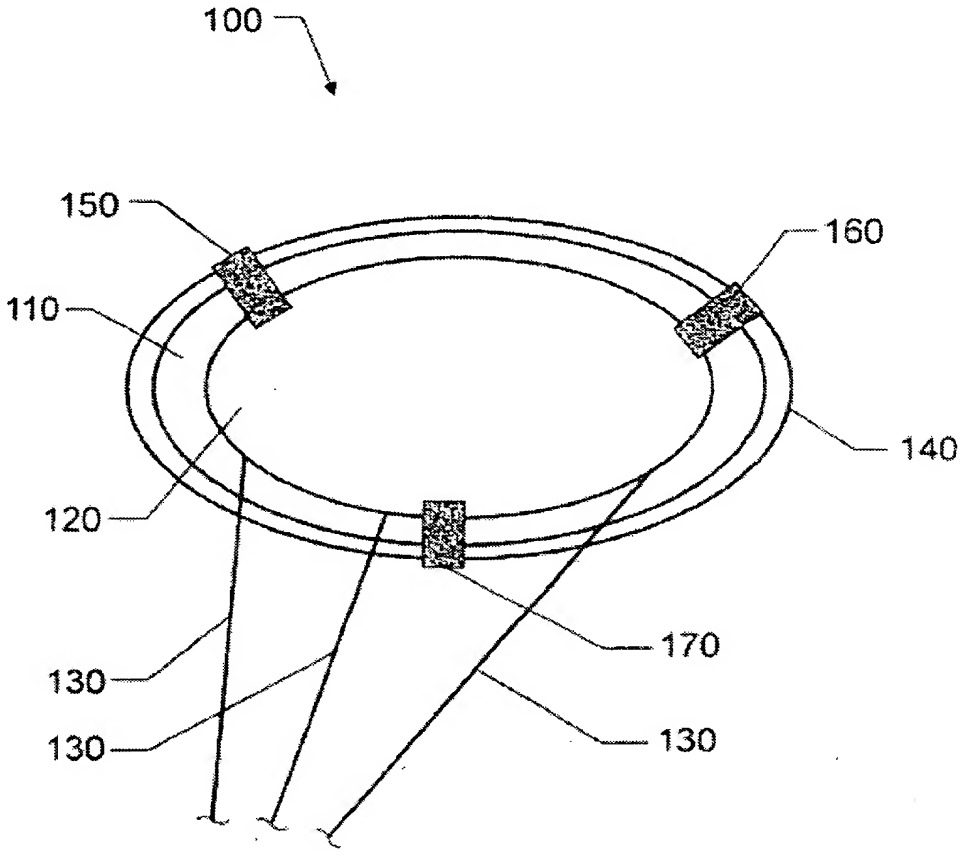
(57) **ABSTRACT**

A membrane structure includes at least one electroactive bending actuator fixed to a supporting base. Each electroactive bending actuator is operatively connected to the membrane for controlling membrane position. Any displacement of each electroactive bending actuator effects displacement of the membrane. More specifically, the operative connection is provided by a guiding wheel assembly and a track, wherein displacement of the bending actuator effects translation of the wheel assembly along the track, thereby imparting movement to the membrane.

6 Claims, 4 Drawing Sheets

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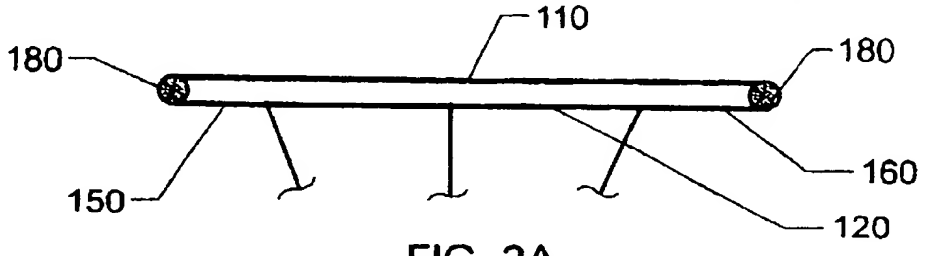

FIG. 2A

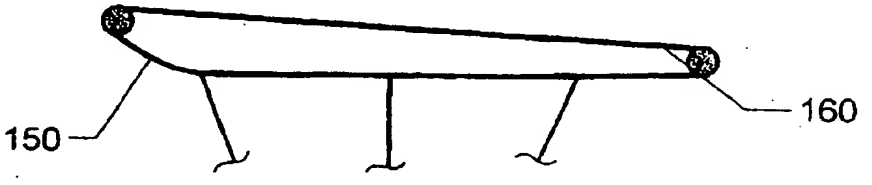

FIG. 2B

FIG. 2C

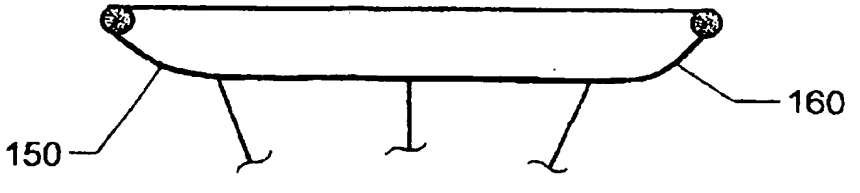

FIG. 2D

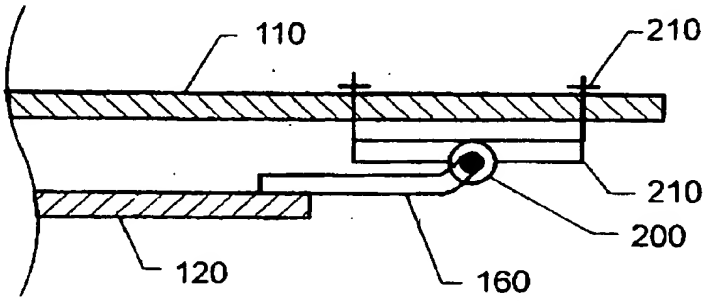

FIG. 3A

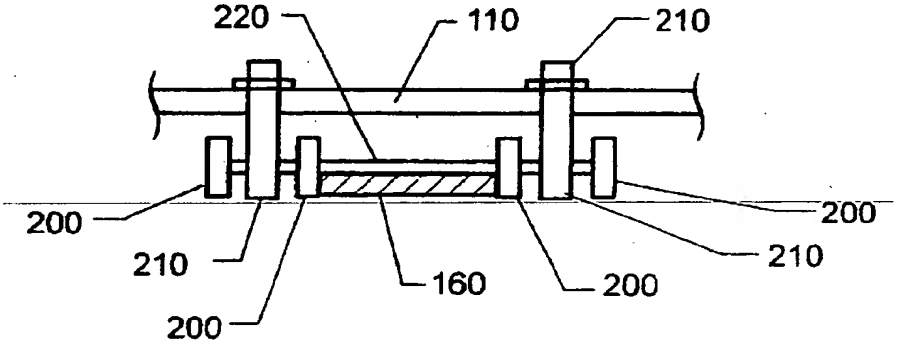

FIG. 3B

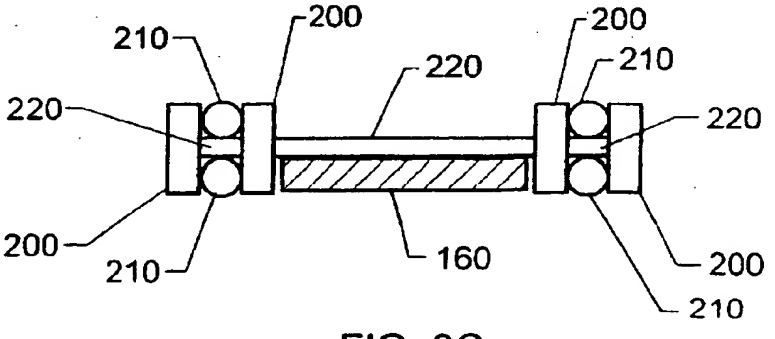

FIG. 3C

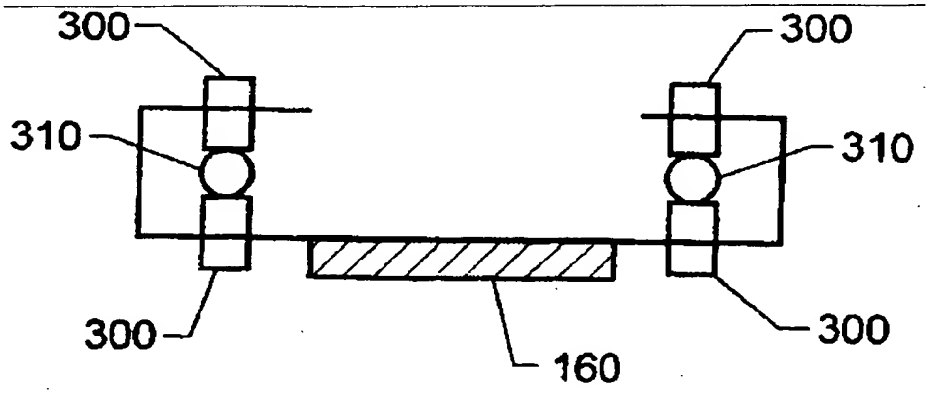

FIG. 4